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A new species of *Philorhizus* Hope, 1838 from Greece (Coleoptera, Carabidae, Lebiini)

David W. Wrase[1,†], Thorsten Assmann[2,‡]

1 *Berlin, Germany* **2** *Institute of Ecology and Environmental Chemistry, Leuphana University of Lüneburg, Germany*

† *urn:lsid:zoobank.org:author:69AD9D96-A4CC-4557-9C1D-590DA5E4A04C*
‡ *urn:lsid:zoobank.org:author:D4400870-C4A7-42B4-A4B4-B4D84DD7CDAE*

Corresponding authors: *David W. Wrase* (carterus@gmx.de), *Thorsten Assmann* (assmann@uni-lueneburg.de)

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Abstract

Philorhizus marggii **n. sp.** is described from Greece (southern Peloponnese). Type locality: Taygetos Massif, Profitis Illias, N 36°58'/E 022°21', 2000-2400 m asl. Members of this micropterous species are distinguished from the other *Philorhizus* species occurring on the Balkans by habitus, the special colouration pattern of the elytra and the special construction of the internal sac of the median lobe. Illustrations of the habitus, the median lobe and its internal sac and a description of the habitat of the new species are presented. A key to all *Philorhizus* species known from Greece is given. Biogeographic notes on the distribution of micropterous *Philorhizus* species in the western Palaearctic realm are given. *Philorhizus paulo* Wrase, 1995 is recorded from France for the first time (East Pyrenees).

Keywords

Coleoptera, Carabidae, Lebiini, *Philorhizus*, new species, Greece, Taygetos Mts., France, Pyrenees, identification key

Introduction

In a previous paper (Wrase, 2005) brief mention was made of a striking, wingless species from the Taygetos Massif, obviously unknown to science. Unfortunately, as only a female representative was found, it was not described.

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In an expedition to a locality in the Taygetos Massif close to the site where the female specimen was collected, one of us (Th.A.) was able to find three males which match perfectly with the original female specimen; thus, we are now able to describe this species, increasing the number of *Philorhizus* (urn:lsid:zoobank.org:act:EF8BB370-B48A-4618-99D3-5975C715D18D) species known from Greece to seven. To simplify the recognition and identification of *Philorhizus* species from Greece we present an identification key to all known species from that country.

Material

The material examined is housed in the collections listed below:

cASSM Collection Th. Assmann, Bleckede, Germany (type material will be given to Zoologische Staatssammlung München)
cMA Collection W.A. Marggi, Thun, Switzerland
cST Collection W. Starke, Warendorf, Germany
cWR Collection D.W. Wrase, Berlin, Germany

Methods

Total body length (BL) is measured from the tip of the mandibles to the apex of the right elytron as the maximum linear distance; the width of the head (HW) as the maximum linear distance across the head, including the compound eyes; the length of the pronotum (PL) from the anterior to the posterior margin along the midline; the length of the elytra (EL) from the basal margin to the apex of the right elytron as the maximum linear distance; the width of the pronotum (PW) and elytra (EW) at their broadest point; the width of the pronotal base (PBaW) between the tip of the hind angles at insertion of seta.

These measurements, made at a magnification of 32X (body length) and 50X, respectively, and using an ocular micrometer in a Leica MZ 16 stereobinocular microscope, were combined as ratios and/or added as follows:

BL: total body length;
PW/PL: width /length of pronotum;
PW/HW: width of pronotum /width of head;
PW/PBaW: width of pronotum/width of the pronotal base;
EL/EW: length/width of elytra;
EW/PW: width of elytra/width of pronotum.

Microsculpture was examined at a magnification of 100X.

Line drawings were prepared using an ocular grid (15 X 15 squares) attached to a Leica MZ 16 stereobinocular microscope. Dissections were made using standard techniques; genitalia were preserved in Euparal on acetate labels, and pinned beneath

the specimens from which they had been removed. The habitus photograph was taken with an Olympus E-330 digital camera in combination with a Leitz MZ 95. Post-processing was done in Adobe Acrobat Professional 7.0. To achieve sufficient depth of focus, 17 planes were captured which were copied to separate layers, and the out-of-focus planes are masked by a stacking programme (Combine Z5).

Description

***Philorhizus marggii* Wrase et Assmann, new species**
urn:lsid:zoobank.org:act:C9BA8153-E92C-4256-9D45-F5168DE60F78

Type material Holotype male: „S-Greece: Peloponnese/Taygetos: Profitis Illias subalpine, 16.V.2007, N 36°58' E 022°21', 2000-2400m asl, 226, leg. Th. Aßmann" (cWR, later in the Zoologische Staatssammlung München). Paratypes: 2 males, same as holotype (cASSM, cST). 1 female: „GR Pelop. /Taygetos Profitis Illias, 1200m, 23.IV.1997, W. Marggi & Ch. Huber leg." (cMA).

Diagnosis A micropterous species of average size for *Philorhizus*, with wide infuscated head, narrow pronotum, long-oval elytra yellowish with a wide dark transverse fascia at apical half and completely rounded humeri. Habitus, see Fig. 1.

Description Body length 3.3-3.7 mm; width 1.38-1.56 mm (holotype 3.6 mm and 1.48 mm, respectively).

Colour: Head (with exception of lighter clypeus) dark or light reddish piceous, mandibles, mouthparts, pronotum and appendages yellowish. Elytral basal half, apical margins and a large semicircular or almost square area around sutural angle testaceous, the remainder infuscated, forming a reddish piceous, wide, transverse, somewhat jagged fascia. The dark area bordering the suture extends slightly towards base of elytra.

Head (Fig. 1) large, almost as wide as pronotum (ratio PW/HW in males: 1.03-1.06, Ø 1.05, holotype 1.05; in female: 1.06). Eyes fairly large and flat, eye diameter about 2.3 to 3.0 times as long as rectilinearly narrowed tempora (seen in dorsal view). Antennae of medium length, slender, antennomeres 4-11 with dense and fairly fine setae except obligatory long apical setae (about as half as long as the latter).

Pronotum (Fig. 1) almost square (ratio PW/PL in males: 1.21-1.27, Ø 1.23, holotype 1.27; in female: 1.36), widest at about end of anterior fourth (at insertion of lateral seta). Anterior margin moderately emarginate, anterior angles rounded, projecting slightly forward, from there slightly curved laterally till insertion of lateral seta (here somewhat angulate), from there basad almost rectangularly narrowed and weakly sinuate before posterior angles which are obtuse and angled strongly forward (at about length of antennomere 2), at insertion of seta weakly angulate. Base medially slightly emarginate, laterally to insertion of seta strongly curved (ratio PW/PBaW in males: 1.21-1.27, Ø 1.24, holotype 1.27, in female: 1.25). Lateral furrows at anterior angles narrow, becoming explanate toward base and continuing into

Fig. 1. *Philorhizus marggii* n. sp., habitus, holotype.

large basal impression. Medial longitudinal impression deep, terminated at anterior and posterior transverse impression. Anterior transverse impression distinct, posterior transverse impression shallow and connecting both basal impressions.

Elytra (Fig. 1) long-oval (ratio EL/EW in males: 1.38-1.41, holotype 1.38; in female: 1.36; ratio EW/PW in males: 1.94-2.03, Ø 1.97, holotype 1.94; in female: 2.05) with completely rounded humeri, widest approximately at beginning of posterior fifth. Striae only suggested, becoming evanescent laterally. Hindwings reduced to small relicts.

Microsculpture mesh pattern on head in males consisting of weakly engraved isodiametric meshes on disc (somewhat more marked in the female), hence surface fairly shiny, on pronotum transverse and on elytra almost isodiametric in both sexes, moderately impressed, surface somewhat shiny.

Median lobe and internal sac structure (Fig. 2): Relatively stout, with apical lamella small, evenly narrowed and apically rounded. Internal sac (in inverted condition) with a long winding, wide band of scales and thorns, which appears in lateral view in the middle part of the median lobe, reaching the apical part, and a short band of thorns, situated ventrally before the apical part.

Comparisons In habitus and other characteristics (shiny head with weakly developed microreticulation, slender antennae, head wide with almost rectilinearly narrowed long tempora, pronotum very narrow, with posterior angles obtuse and angled strongly forward, micropterous, elytra with completely rounded humeri) similar to *Ph. alpinus* (Meschnigg, 1934), described from the Aroania Mountains (Greece). The new species can be distinguished from *Ph. alpinus* by its piceous head, by the elytra with a distinct, wide, dark transverse fascia at apical half which extends forward along the suture, omitting a large, testaceous semicircular or square area around the sutural angle, and by somewhat shorter tempora (while *Ph. alpinus* is unicolorous, tempora almost as long as eye diameter). A comparison of the male genitalia cannot be given here, as the only specimen of *Ph. alpinus* we were able to study was a female (see Wrase 2005).

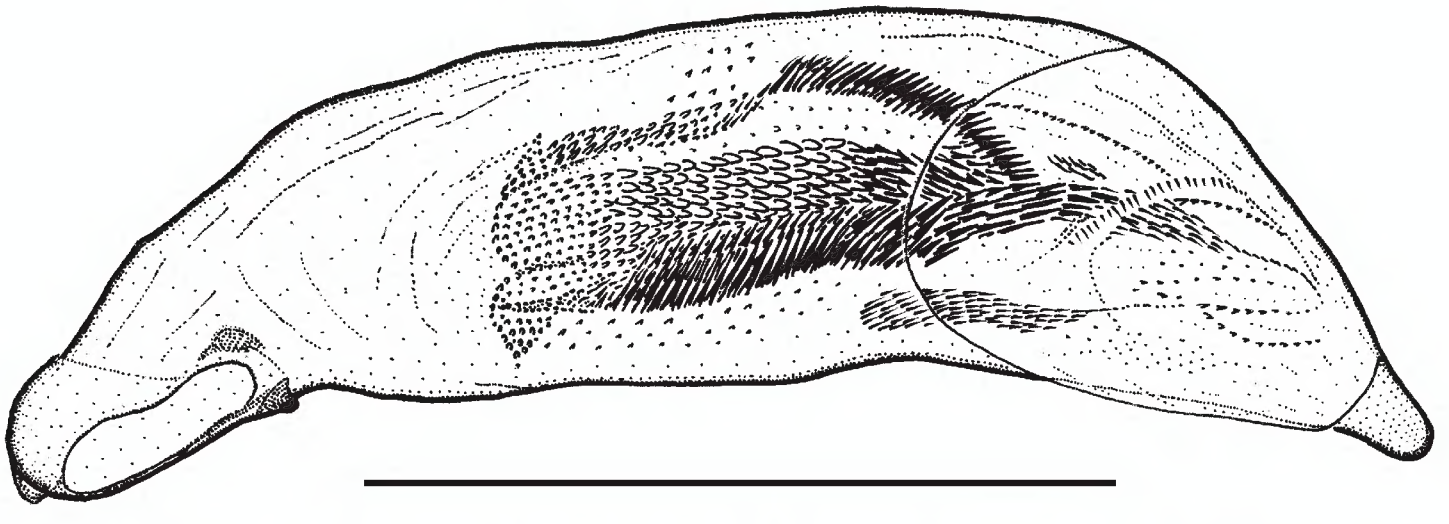

Fig. 2. *Philorhizus marggii* n. sp. male genitalia, median lobe, lateral view, holotype. Scale bar 0.5 mm.

The new species can be differentiated from the other species occurring in the Balkan Peninsula [*Ph. crucifer crucifer* (Lucas, 1846), *Ph. lompei* Wrase, 2005, *Ph. melanocephalus* (Dejean, 1825), *Ph. notatus* (Stephens, 1827), *Ph. quadrisignatus* (Dejean, 1825) and *Ph. sigma sigma* (P.Rossi, 1790)], and also from *Ph. dacicus* Sciaky, 1991 (Romania, Ukraine) by its characteristic colouration (see figures in Sciaky, 1991, and Wrase, 2005), the almost rectilinearly narrowed long tempora, the characteristic form of the pronotum with its obtuse posterior angles angled strongly forward (at about the length of antennomere 2), and therefore its base laterally strongly rounded toward the posterior angles, and by the different construction of its median lobe and the striking structure of its internal sac (compare figures in Sciaky, 1991, and Wrase, 2005). For better distinction we present an identification key (see below).

Etymology It gives us great pleasure to be able to dedicate this new species to our colleague and friend Dr. Werner A. Marggi (Thun), well-known specialist in Carabidae, who collected (together with Dr. Charles Huber, Bern) the first known specimen of the new species.

Distribution Up to now only known from the type locality in the Taygetos Massif and most likely an endemic species.

Habitat The specimens from 2007 were collected from low down on stones in subalpine meadows at altitudes of 2000 to 2400 m (Fig. 3). The stones were well embedded in the ground and surrounded by grass, which was taller than in the meadow grazed by goats and sheep. Beetles' activity on the plants is therefore likely to be typical for many other lebiine carabids (cf. Stork 1980). The specimen from 1997 was collected in the montane zone close to a small pond. These records indicate that the species probably occurs in the middle and higher altitudes of Mount Taygetos.

Biogeographic notes on the unwinged *Philorhizus* species from the West Palaearctic realm

Philorhizus marggii n. sp. belongs to a group of species of the genus *Philorhizus* which is characterized by microptery (or brachyptery) and by the fact of its distribution in mountainous regions. As far as is known at present, these species occur in the western part of the Palaearctic realm from the Macaronesian Islands (Canary Islands, Madeira), the Iberian, Apennine and southern Balkan Peninsulas, up to the Caucasus. The northern limit is marked by populations in the Ukraine, the southern by those in the Sierra Nevada, northern Sicily, Turkey and by the population(s) of *Ph. marggii* n. sp. from southern Greece (cf. Sciaky 1991; Wrase 2005). *Philorhizus tinauti* Anichtchenko, 2005, a sister species of *Ph. mendizabali* Mateu et Colas, 1954), is known from low altitudes in eastern Andalucia (Almería, Anichtchenko 2005). At least most, if not all, of these species live in southern glacial refuge areas of the western Palaearctic. Distribution pattern and low power of dispersal resulting from microptery (or brachyptery) in combination

Fig. 3. Habitat of *Philorhizus marggii* n. sp.

with small body size suggest that these taxa survived the glacial periods within or close to the recent/present-day distribution areas (cf. Holdhaus 1954). Moreover, we believe that these endemic *Philorhizus* species are relicts because in many cases not only one, but several massifs are colonized (cf. Habel and Assmann 2008). In contrast to some extreme endemics, such as numerous *Trechus* species or cave dwelling carabids, it is highly probable that these *Philorhizus* species had a wider distribution in the past. Otherwise it is difficult to explain the existence of some isolated populations of the same species such as *Ph. dacicus* Sciaky, 1991 known from Romania and Ukraine (Kabak 2003), *Ph. brandmayri* Sciaky, 1991 recorded from Sicily and the Aspromonte Mountains in Calabria and *Ph. paulo* Wrase, 1995 distributed in northern Spain and the Pyrenees. A new record from a locality in the East Pyrenees, about 5 kilometres southwest from Prades-de-Mollo-la-Preste, close to the Spanish border, enlarges the known distribution area of *Ph. paulo* to southern France (first record for France: "France, Collado de Ares, 27.V.1978, Hozman lgt." (Dept. Pyrénnées-Orientales); 1 male in cWR).

Key to the species of *Philorhizus* Hope from Greece

1 Pronotum very narrow (ratio width/length 1.21-.36), with posterior angles obtuse and angled strongly forward (at about the length of antennomere 2), and therefore its base laterally strongly rounded toward posterior angles. Tempora long, almost as long as eye diameter, or somewhat shorter, almost rectilinearly narrowed, distinctly set off against neck (see Figs 2, 3 in Wrase, 2005). Two species from the Peloponnese (Aroania and Taygetos Mts., with strongly reduced hindwings, elytra with completely rounded humeri 2

– Pronotum wider (ratio width/length <1.21), with posterior angles less obtuse and only weakly angled forward, its base weakly rounded laterally toward posterior angles (see Figs 2, 15, 16, 17 in Sciaky, 1991). Tempora short, ± distinctly curved to the neck. Macropterus or micropterous species with a wider distribution 3

2. Unicolorous pale yellowish red, only dorsal side of head and an indistinct macula in posterior half of elytra rusty red. Tempora almost as long as eye diameter. Alpine regions of northern mountains in Peloponnese..... .....***Ph. alpinus*** **(Meschnigg, 1934)**

– Head (more or less dark reddish) piceous, elytra with a distinct, wide, dark transverse fascia at apical half extending forward along suture, omitting a large, testaceous semicircular or square area around sutural angle, abdomen dark. Tempora somewhat shorter. Alpine regions of Taygetos Mountains in Peloponnese.....***Ph. marggii*** **nov. sp.**

3. Strongly brachypterous, elytra very short (ratio length/width 1.22-1.30), with completely rounded humeri. Elytral basal third testaceous. Small species (2.8-3.4 mm). Southern Greek mainland (Parnassos) and northern mountains in Peloponnese.....***Ph. lompei*** **Wrase, 2005**

– Macropterus or micropterous species, elytra long (ratio length/width >1.40), in both cases elytral humeri distinctly developed..... 4

4. Large species (3.7-4.7 mm). Macropterous, elytral humeri dark brown. From the Canaries to the Near East.....***Ph. quadrisignatus*** **(Dejean, 1825)**

– Smaller species (2.5-3.5 mm). Macropterous to micropterous, elytral humeri always light 5

5. Elytra pale yellowish, as a rule with darkened suture. From western Mediterranean area to Asia Minor and Caucasus..... ..... ***Ph. melanocephalus*** **(Dejean, 1825)**

– Elytra always with dark pattern: dark transverse fascia in middle or at least a wide band along parts of suture and posterior part of lateral margin 6

6. Elytra on average more slender (ratio length/width 1.51-1.57, Ø 1.54), almost parallel-sided, with narrow transverse dark fascia, dark pattern more cross-like, the central square-like macula often without connection to the lateral longitudinal darkenings. Pronotum usually darkened in middle. Internal sac of median lobe of aedeagus with tubular, long-winding

structure, apically darkened by longer and denser microspines. Median lobe with longer apex (see Fig. 22 in Sciaky, 1991). From western Mediterranean area, Asia Minor, Middle East to Middle Asia. On the Balkan Peninsula with ssp. *crucifer* ..... ***Ph. crucifer* (Lucas, 1846)**

– Elytra on average wider (ratio length/width 1.41-1.54, Ø 1.46) and slightly widened apically, with very variable colour pattern, transverse dark fascia usually very wide, but sometimes not distinct, disappearing. Pronotum rusty red, often darkened on disc. Internal sac of median lobe of aedeagus with 2 subparallel fields of denticles. Apex of median lobe shorter and rounded (see Fig. 21 in Sciaky, 1991). Whole of Europe to Near East ..... ***Ph. notatus* (Stephens, 1827)**

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